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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

LU, KUEN S

ART UNIT	PAPER NUMBER
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2167

DATE MAILED: 12/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/066,481

Applicant(s)

KURTH, HUGH R.

Examiner

Kuen S Lu

Art Unit

2167

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 01 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendments

1. The Action is responsive to the Applicant's Amendments, filed on July 1, 2004.
2. In responding to Applicant's Amendments made to the claims where new issues relating to "a given area of the data buffer can be assigned to the given queue and then assigned to a different queue in the plurality of queues at a later time" was introduced, the Examiner has created this Office Action for Final Rejection (hereafter "the Action") as shown next.
3. As for the Applicant's Remarks on claim rejections, filed on July 1, 2004, has been fully considered by the Examiner, please see discussion in the section ***Response to Arguments***, following the Office Action for Final Rejection.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 1 and 9 are rejected under 35 U.S.C. 102(e) as anticipated by Sangha et al. (U.S. Publication 2002/0176430, hereafter "Sangha").

As per claims 1 and 9, Sangha teaches the following:

"providing a plurality of pointers to the data buffer, each pointer associated with an area of the buffer" at Page 1, [0012] by using one queue for storing pointers pointing to data

Art Unit: 2167

buffers which are shared by communication processes to receive packets, and another queue for storing pointers pointing to data buffers which are shared by communication processes to transmit packets;

“creating a given queue in the plurality of queues by associating a given pointer from the plurality of pointers with the given queue” (See col. 2, [0014]-[0016] wherein Sangha’s RFQ, WFQ, RRQ and TRQ queues are created by storing data pointers pointing data buffers in memory is equivalent to Applicant’s creating a given queue by associating a given pointer from the plurality of pointers with the given queue); and

“wherein a given area of the data buffer can be assigned to the given queue and then assigned to a different queue in the plurality of queues at a later time” (See Page 2, [0016] wherein Sangha’s WFQ stores freed data pointers pointing to data buffers in external memory after the communication packets stored there are processed and transmitted is equivalent to Applicant’s wherein a given area of the data buffer can be assigned to the given queue and then assigned to a different queue in the plurality of queues at a later time).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2-6, 8, 10-14, 16 and 17-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sangha et al. (U.S. Publication 2002/0176430, hereafter "Sangha"), as applied to Claims 1 and 9, and in view of Kao (U.S. Publication 2003/0037096).

As per claims 2 and 10, Sangha does not specifically teach a free pointer "linked list", although Sangha teaches "storing the plurality of pointers" by implementing Read Free Queue to include free pointers at Page 2, [0014] and "providing a plurality of pointers" at Page 1, [0012] by using queues for storing pointers to data buffers.

However, Kao teaches creating and maintaining a linked list of buffer at Page 1, [0005].

It would have been obvious to one having ordinary skill in the art at the time of the applicant's invention was made to combine Kao's reference with Sangha's by storing pointers in a free pointer linked list because both references are devoted to data buffer queue management (KAO: Abstract showing managing buffer queue to store data queue; Sangha: Abstract showing managing data packets in data buffers pointed by pointers storing in queue) and by doing so the data buffers can be rapidly added or removed from the queue since the list is linked. Furthermore the dynamic management of data buffers and queue would have helped in efficiently utilizing a limited size of on-chip memory should the buffers implemented on memory (Kao: [0008], Sangha: [0014]).

As for claims 3 and 11, Kao further teaches "associating the given pointer includes removing the given pointer from the free pointer linked list" at Page 5, [0057] where data elements are removed from data queue, buffer is recycled and the pointer is reset.

As for claims 4 and 12, Kao further teaches “associating the given pointer further includes storing the pointer in a given queue linked list” at Page 1, [0004] where buffers are associating buffer to memory locations and queued by linked lists.

As per claims 5, 13 and 18, Kao further teaches “removing the given pointer from the queue linked list and adding the given pointer to the free pointer linked list to delete a member of the given queue” at Page 5, [0057] by removing data from the data queue, recycling the buffer and resetting the pointer.

As per claims 6 and 14, Sangha further teaches “the given queue is a FIFO queue” at Page 3, [0034] where a buffer management queue has a write FIFO and read FIFO.

As per claims 8 and 16, Kao teaches “the free pointer linked list and the given queue linked list are stored in a given data structure” at Fig. 3, elements 41 and 46 where cache structures are provided to store the beginning of utilized linked list of buffers and the beginning of the free linked list of buffers.

As per Claim 17, Sangha teaches the following:

“a shared data buffer” at Page 1, [0010]-[0012] by utilizing data storage units as data buffers to store communication packets shared by communication processes to store and transmit data packets;

“a pointer array pointing to a plurality of areas of the data buffer” at Page 1, [0012] by using one queue for storing pointers to a data buffer; and

“wherein a given area of the data buffer can be assigned to the given queue and then assigned to a different queue in the plurality of queues at a later time” (See Page 2, [0016] wherein Sangha’s WFQ stores freed data pointers pointing to data buffers in

external memory after the communication packets stored there are processed and transmitted is equivalent to Applicant's wherein a given area of the data buffer can be assigned to the given queue and then assigned to a different queue in the plurality of queues at a later time).

Sangha does not specifically teach "a free list data structure including an entry count, a head pointer to the data buffer and a tail pointer to the data buffer".

However, Kao teaches "a free list data structure including an entry count, a head pointer to the data buffer and a tail pointer to the data buffer" at Fig. 3, elements 41 and 46 where cache structures are provided to store the beginning of utilized linked list of buffers and the beginning of the free linked list of buffers.

It would have been obvious to one having ordinary skill in the art at the time of the applicant's invention was made to combine Kao's reference with Sangha's by storing pointers in a free pointer linked list because both references are devoted to data buffer queue management (KAO: Abstract showing managing buffer queue to store data queue; Sangha: Abstract showing managing data packets in data buffers pointed by pointers storing in queue) and by doing so the data buffers can be rapidly added or removed from the queue since the list is linked. Furthermore the dynamic management of data buffers and queue would have helped in efficiently utilizing a limited size of on-chip memory should the buffers implemented on memory (Kao: [0008], Sangha: [0014]).

Kao further teaches "a queue state including a plurality of virtual queue data structures, each queue data structure including a queue entry count, a queue head pointer and a queue tail pointer, the queue head pointer and the queue tail pointer

pointing to areas of the data buffer” at Page 1, [0006] where head pointer and tail pointer are store at the first and second locations, and at Page 4, [0046] where a count of data elements in the data queue is stored in a dummy buffer; and “logic for deleting an entry from the free list data structure and adding the entry to a given virtual queue data structure” at Page 4, [0043]-[0044] by using ‘recycle then read’ and ‘read then recycle’ to manage a buffer queue.

8. Claims 7 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sangha et al. (U.S. Publication 2002/0176430, hereafter “Sangha”) in view of Kao (U.S. Publication 2003/0037096), as applied to claims 2-6 and 10-14, and in further view of Oksanen (U.S. Publication 2002/0116568).

As per claims 7 and 15, the combined Kao-Sangha reference does not teach a LIFO queue, although Kao teaches FIFO queue at Page 3, [0034].

However, Oksanen teaches “given queue is a LIFO queue” at Page 2, [0011] by applying both FIFO and LIFO queues.

It would have been obvious to one having ordinary skill in the art at the time of the applicant’s invention was made to combine Oksanen’s reference with Kao and Sangha’s including LIFO queue in the queue disciplines because all the three references are devoted to buffer, queue and pointer management (KAO: Abstract showing managing buffer queue to store data queue; Sangha: Abstract showing managing data packets in data buffers pointed by pointers storing in queue; Oksanen: Abstract showing implementation of double-ended queue in a memory and memory management system). The combination of references would have allowed a memory

element be added as the first element of the buffer forming the front end of the queue, or as the last element of the buffer forming the tail end of the queue, by algorithms of LIFO and FIFO implementations. The inclusion of both FIFO and LIFO queues in the queue discipline would have provided flexibility to queue, buffer and pointer management.

9. The prior art made of record

- A. U.S. Publication 2002/0176430
- B. U.S. Publication 2003/0037096
- C. U.S. Publication 2002/0116568

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- D. U.S. Patent 5,230,071

Response to Arguments

10. The Applicants' arguments filed on July 1, 2004 have been fully considered but they are not persuasive, for the Examiner's response, please see discussion below:

a). At Page 6, claims 1 and 9, Applicant argued that in the Sangha reference, data buffers may be wasteful because one queue may be full to cause data packets to be stored in external memory while the second queue is empty.

As to the above argument a), the Examiner respectfully disagreed. In Sangha reference, data packets are received, processed and transmitted from one queue to another suggesting the queues are dynamically utilized by the flowing data packets

Art Unit: 2167

(See Page 2, [0013]-[0017]). However, the efficient utilization or management of data buffers and queues are not directly relevant to the claims.

b). At Page 6, claims 1 and 9, Applicant argued that in the application's queues sharing data areas and suggested Sangha, Kao reference or their combination otherwise.

As to the above argument b), the Examiner respectfully disagreed. In Sangha reference, data pointers are stored in queue and returned to another queue when the pointers usage status are changed. Further, the reference specifically points out that free data pointers stored in WFQ (write free queue) are returned to RFQ (read free queue) and thus teaches sharing data areas.

c). At Page 7, claims 1, 9 and 17, Applicant argued that in the application's queues sharing data areas and amendments were made to support the amended claims.

As to the above argument c), the Examiner respectfully disagreed and maintained the original grounds for rejecting all original claims. In the Office Action for Final Rejection as previously described, the Examiner has added new ground from the original reference to the original grounds for rejecting the amended claims.

10. In light of the forgoing arguments, the 35 U.S.C 102 rejection for Claims 1 and 9, and the 35 U.S.C 103 rejection for Claims 2-8 and 10-18 is hereby sustained.

Conclusion

11. THIS ACTION IS MADE FINAL.

The Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

12. The prior art made of record, listed on form PTO-892, and not relied upon, if any, is considered pertinent to applicant's disclosure.

If a reference indicated as being mailed on PTO-FORM 892 has not been enclosed in this action, please contact Lisa Craney whose telephone number is 571-272-3574 for faster service.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kuen S Lu whose telephone number is 571-272-4114.

The examiner can normally be reached on 8 AM to 5 PM, Monday through Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Breene can be reached on 571-272-4107. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

Kuen S. Lu



Patent Examiner

November 27, 2004



Luke Wassum

Primary Examiner

November 27, 2004